Analysis of the Causes of Silicon Valley Bank's Collapse and Implications

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Abstract. In recent years, financial innovation continues to develop, and the business of banks gradually become specialized. These phenomena cause changes in the risk structure of banks, especially when the relationship between banks and high-growth industries like technology becomes closer. Taking the collapse of Silicon Valley Bank (SVB) in recent years as an example, this article studies how a bank with high dependence on customers in the technology industry gradually accumulates risks during its rapid development and finally leads to the collapse. The research results show that the collapse of Silicon Valley Bank is not due to one or two operational errors, but the joint effect of the above factors in the situation of long-term loose monetary policy. That is, the concentrated deposit structure of banks, financing-driven cash flow characteristics of the technology industry, long-term asset allocation leading to the exposure of interest rate risks, rapid transmission of confidence shocks in the face of interest rate hikes, and the lack of identification and correction of risks in medium-sized banks at the timing point, which exacerbated the cumulative effect of risks. The research results in this paper can help people have a better understanding of the risk formation mechanism of specialized banks and provide references for the stable operation of financial institutions and improvement of regulatory policies.

Keywords: Silicon Valley Bank, Asset-Liability Mismatch, Bank Stability, Government Regulation.

1 Introduction

With the deepening of the global financial system and the promotion of the professionalization level of banking industry in recent years, commercial banks gradually play a more and more important role in the development of real economy and industrial innovation. Particularly in the face of the rapid development of technology industry, the close relationship between banks and high growth industry has been gradually formed. On the one hand, the long-term lose money policy environment reduces the financing cost significantly, which promotes the continuous inflow of capital into high growth industries such as technology; on the other hand, the high concentration of funds in high growth industry and a few banks also gradually

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accumulate the system risks. In addition, some previous studies also find that in the environment of low interest rate and high liquid, financial institutions tend to improve profit by creating maturity mismatch and risk concentration, which will weaken the overall stability of the financial system [1].

Based on the macro and industry context, why did SVB collapse in 2023? As a professional bank serving technology companies and venture capital companies for a long time, SVB collapsed suddenly due to the liquidity crisis.

The above case has attracted much attention from the market and the supervisory authorities. As a professional bank serving technology companies and venture capital companies for a long time, SVB collapsed suddenly due to the liquidity crisis and ran out of money and was taken over. In addition to shaking the stability of regional banks in the United States, the collapse of SVB also prompted the academic circle and the supervisory authorities to reflect on the structural problems of medium size banks in asset liability management, customer concentration and risk control. Therefore, it is of great significance to analyze the reasons for the collapse of SVB in a systematic way. Not only can it help people explain the mechanism of the occurrence of the collapse of a single bank, but it can also provide a reference for preventing the same risk from occurring in other banks [2].

In the past, bank crisis and financial stability have been studied from macro and micro perspectives. The related results show that, in the long term, a loose monetary environment will increase the risk appetite and drive up the prices of assets and make the financial system more vulnerable; at the micro level, the studies focus on the imbalanced bank asset liability structure, concentrated bank deposits sources and lack of liquidity management, which tend to amplify the risks and trigger crises quickly when faced with external shocks. In addition, related studies on bank runs show that, when faced with incomplete information and fragile confidence, even if banks are not actually insolvent in books, the aggregate behavior of rational depositors will trigger a liquidity crisis through a self-fulfilling mechanism. However, the path of concentrated release and accumulation in particular industry cycles of highly specialized banks has been studied less [3].

According to the above research gaps, this paper uses the case analysis method, takes SVB as the research object, and summarizes its development process from start-up period, acceleration expansion period, mature period to the period of collapse. In the process of this research, this paper will integrate and integrate the relevant theoretical views from the following multiple levels: macroeconomic and technology industry environment, bank business model and balance sheet structure, risk transmission mechanism of interest rate hikes, regulatory institutional arrangement, and analyze the collapse reason of SVB. The research focus of this paper is not any single kind of management or investment decision-making error, but the process of risk accumulation and concentrated release.

2 Case Analysis

2.1 Startup Phase (1983–1990s)

When Silicon Valley Bank founded in 1983, American traditional commercial banks usually based on the cash flow, collateral and true historical financial report for lending, which made the early-stage technology start-up in a disadvantage position in the traditional credit system [1]. Silicon Valley Bank positioned itself in the form of a "difference", providing financial service chain "innovation enterprise - venture capital - capital market", instead of seeing the start-up as high-risk loan customers [2]. In terms of business practice, SVB constructed a long-term cooperation relationship network with Silicon Valley venture capital institutions, and focused on investors' recommendations, financing process and financing amount assessment in credit and account service, which promoted its gradual integration into the entrepreneurial environment and enhance the professional image [3].

2.2 Acceleration Phase (1990s–2010s)

Generally, somewhen at the start of the 1990s, the diffusion of the Internet know-how and the capital markets' valuation of technology companies driven collectively the technological industry into a growth cycle and strengthened venture capital's position in innovative financing [4]. And plenty of the technology companies have developed a continuing need for cash management, payment settlement, and credit lines within the financing and growth course of. SVB improved the stickiness of technology companies by industry services [5]. When customers expanded their enterprise overseas, SVB gradually extended its enterprise to overseas innovation centers and transformed its enterprise mannequin from a regional specialized bank to an international know-how bank [6].

2.3 Maturity Phase (2010s–2020s)

After 2010, the number of unicorn companies increased, and the number of financing rounds increased, which improved the demand of technology enterprises for "whole life financial service". Bank and VC formed a close relationship [7]. According to the data from International Monetary Fund, the total bank deposit of Silicon Valley Bank reached about 173.1 billion US dollars at the end of 2022. In the sample period, the proportion of total bank deposits of Silicon Valley Bank that were not protected by deposit insurance was as high as 89%, which was much higher than the industry average of about 45%. This characteristic of Silicon Valley Bank is closely related to the highly concentrated customer structure of Silicon Valley Bank. As shown in the regulatory data, from 2010 to 2022, the proportion of technology enterprise customers of Silicon Valley Bank increased from 65% to 82%; at the same time, the proportion of deposits of Silicon Valley Bank's top 20 largest customers reached 34%, while the average proportion of the top 20 largest customers of similar mid-sized banks in the United States was about 12%. These results show that the deposits of Silicon Valley Bank come from a highly concentrated customer structure at both the industry level and the

customer level. Once market confidence decreases, the risk that a large number of deposits decrease at the same time will also increase, which will weaken the liquidity stability of the bank [7]. In addition, the analysis results show that when the customer base, deposit sources and bank business activities of a bank depend on a single industry cycle for a long time, the balance sheet of the bank will show that it is more sensitive to changes in industry prosperity and capital market sentiments for a long time, and the risk will also accumulate more gradually during the pro-cyclical expansion [8].

2.4 Bankruptcy Phase (2023)

After the pandemic, the ultra-low-interest rate environment and the boom of technology financing caused SVB to absorb many corporate deposits and make a high proportion of uninsured deposit structure, making it more likely to experience rapid outflows of deposits under confidence shocks [9]. In terms of assets, in order to offset liability costs and get returns, SVB allocated a large amount of funds to long-term government bonds and institutional MBS and other fixed assets with high sensitivity to interest rate increases [3]. When the inflation pressure increases and the Federal Reserve continues to raise interest rates in 2022–2023, the prices of long-term bonds will decrease, causing SVB to suffer from large unrealized losses and facing the situation of being forced to "sell to realize losses" under liquidity pressure, thereby depleting capital and shaking market confidence [3]. After the bank disclosed losses and financing plans, large deposit customers rapidly withdrew funds and the banknote run was accelerated due to the information dissemination effect and enterprise online bank transfers, finally causing a liquidity shortage in the short term and triggering a regulatory takeover [10]. On March 8th, 2023, Silicon Valley Bank disclosed a 1.8-billion-dollar asset disposal loss and planned to raise 2.25 billion dollars of financing. Market panic broke out. On March 9th, SVB withdrew about 42 billion US dollars in deposits, which accounted for 24.3% of its total deposits. This number far exceeded its available liquidity reserve [9]. The occurrence of large-scale concentrated withdrawal in a short period of time forced the bank to quickly sell assets to meet the payment demand, causing a sharp increase in liquidity pressure. This situation is consistent with the "self-reinforcing" situation in the bank run theory: when the confidence of depositors about the stability of the bank decreases and the information is limited, the behaviors of individual withdrawal will be reinforced by each other. Even if the bank has not yet reached the situation of being insolvent in terms of assets, it may also trigger a liquidity crisis due to concentrated withdrawals [11].

3 Case Analysis

3.1 Macroeconomic and Industry Context

People should place Silicon Valley Bank's failure in the context of the macroeconomy worldwide and the technology industry. From 2010 to 2021, the monetary policy worldwide was relatively loose. Particularly during the pandemic, the ultra-low interest rate and massive liquidity pushed the valuations of risky assets to very high levels and

enhanced the trend of capital flowing into high-growth technology enterprises [12]. Under such circumstances, the technology industry generally showed a feature of heavy reliance on external financing rather than self-sustaining operation cash flow. Venture capital, private equity financing, and capital market financing were the primary means of providing funds for the expansion of technology enterprises, and a large number of enterprises could obtain a large amount of cash reserves within a short period through these means [13]. In addition, the loose financial environment reduced the cost of funds and weakened the market's tolerance for risks and maturities mismatch, which provided the macroscopic environment for the subsequent accumulation of risks in the system [14].

3.2 Vulnerabilities in Silicon Valley Bank's Business Model and Balance Sheet Structure

In the above industry context, Silicon Valley Bank formed its business model with high concentration of business on technology enterprisecircle and venture capital circle gradually. The financing-proceeds of many technology enterprisecircle were deposited in the Silicon Valley Bank. It took a short period of time for the Silicon Valley Bank to absorb a huge and highly concentrated deposit circle with 2 main characters: first, concentrated customers' industry; second, large single deposit size and a huge proportion of money without deposit insurance [15]. While the growth of loan on the asset side was limited, the Silicon Valley Bank still invested a large amount of funds into long-term US Treasury Bonds and Agency Mortgage-Backed Securities in order to raise the yield level. However, the long-term fixed income assets extended the asset duration significantly. When the market interest rate rose rapidly, the market value of these bonds fell sharply. The market value of these bonds fell sharply because of the long asset duration of the Silicon Valley Bank, which had insufficient hedging of interest rate risks and a small degree of liquidation liquidity buffer. Although the Silicon Valley Bank held a large amount of high rated Bonds on the surface, it still faced huge interest rate risk and liquidity risk [14].

3.3 Dynamic Evolution of Interest Rate Shock, Liquidity Pressure, and Bank Runs

When the global inflation wave surged and the Federal Reserve began its rapid interest rate increase from 2022 to 2023, these inherent weaknesses were quickly triggered. The interest rate increase caused a sharp decline in the prices of long-term fixed-rate bonds and resulted in substantial unrealized losses on the asset side of Silicon Valley Bank [12]. The tightening of the monetary policy and the decline in the capital market simultaneously deteriorated the financing environment for technology enterprises. To maintain their operations, many technology companies began to withdraw their existing deposits, triggering continuous withdrawal pressure on the liability side [13]. When the Silicon Valley Bank publicly released asset disposal loss information and announced its financing plan, the market interpreted this as Bank liquidity and capital pressure information. When the proportion of non-insured deposits was extremely high, large deposit customers acted rationally in an attempt to avoid risks and took action

accordingly. Silicon Valley Bank triggered a bank run. As the scale of withdrawals continued to increase, the bank had to sell assets and convert book losses into actual losses, further deteriorating market confidence and triggering a typical self-fulfilling bank run mechanism. Eventually, the bank lost its liquidity in a very short period [15].

3.4 Insufficient Regulatory Framework and Institutional-Level Explanations

From the perspective of the institution, the failure of Silicon Valley Bank also reflected the inadequacy of the regulatory system for medium-sized banks. Compared with the systemically important banks, the requirements of capital and liquidity and stress testing for Silicon Valley Bank are relatively relaxed. These have caused certain regulatory risks in the bank's asset duration management, interest rate risk exposure and deposit concentration [14]. In addition, although the regulatory authorities have perceived these risks before, when the risk was in the adjustable period, the implementation intensity and timeliness of the corrective measures were not strong enough, and they did not play a good role in prompting banks to reduce duration risks or enhance the liquidation reserve [15]. Therefore, the collapse of SVB cannot be regarded as the failure of corporate governance. The crisis gradually formed in the macro environment of the high interest rate speed at that time: on the one hand, the bank itself had certain weak links in asset duration, customer concentration, and liquidity management; on the other hand, the interaction of the rise in interest rates and external shocks such as the outflow of deposits and the lack of timely implementation of relevant regulations and risk identification jointly led to the outbreak of crisis.

4 Corresponding Suggestions

4.1 Systemic Risk Perception of Macro Environment and Industry Cycle

From the macro view and industry analysis point of view, the failure of SVB shows that the low-interest rate environment for a long time and high growth expectation of technology industry may unintentionally enhance the aggregated effects of concentrated risks in the financial system. If the capital continuously flows into the same high growth industries, the structure of corporate financing, the sources of bank customers and the risk profile of financial intermediaries will be gradually homogenized. If the prosperity of an industry reverses or the financial situation of customers becomes tight, the impact will be diffused and reflected among related financial institutions at the same time, which will impair the financial system's ability to resist external shocks [1]. Therefore, the macro environment and industry cycle should not be treated as a simple external environment but should be treated as an important scenario variable in bank's risk identification and stress testing process. For the regulatory authorities, continuously monitoring the industry concentration and changes of capital flow in the booming period can find out the gradually accumulated systemic risks in loose environment [8].

4.2 Endogenous Constraints of Business Model and Balance Sheet Structure

Based on the business model and balance sheet structure of Silicon Valley Bank, this case shows the positive effects and negative effects of high specialization and high concentration through the experience of Silicon Valley Bank. Certainly, becoming more specialized is a way to gain information advantages and to provide better services and to be a technological innovation game rules maker. However, if their customers are concentrated in the same economic sector, deposit sources are concentrated in the same economic sector, and the allocation of assets is concentrated in the same economic sector, then the positive effect of concentration accumulates, and the overall ability to withstand shocks drops dramatically. From the experience of Silicon Valley Bank, people can see that the higher level of deposit concentration and the further extension of the asset maturity structure will cause the balance sheet mismatch risk to increase rapidly under circumstances of a fast rise in interest rates [4].

Therefore, the experience from this case tells people that, in addition to the scale expansion and professional advantages, banks should optimize their business model in structure and actively explore the diversification management of customer structure, for example, limit the proportion of customers of a single industry, and actively expand the high growth area outside of the technology industry, such as high-end manufacturing and green industry, to reduce dependence on the cycle of a single industry for customers.

As for liability management, banks should also establish stratification management mechanism of deposit, implement proportion restriction on large amount uninsured deposit and keep the proportion of large amount uninsured deposit below 50%. Banks can attract more small amount uninsured deposit through interest incentive or product design to keep the deposit not too concentrated. Through the above measures, banks can optimize the stability and risk resistance of their balance sheet while maintaining the professional advantages [8].

4.3 Importance of Liquidity Management and Confidence Mechanism

From the point of view of the chain transmission process, the collapse of SVB is not due to the decline of traditional asset quality, but the vicious cycle of liquidity pressure and the decline of depositors' confidence. Under the situation that the large uninsured deposits occupy a high proportion and the clients are mostly mature financial enterprises and investment institutions; the early warning information will cause the depositors to rush to withdraw in a defensive manner. Once the large depositors rush to withdraw their funds first to protect their funds safely, the other depositors will follow the behavior of large depositors and the withdrawals will converge, and the bank's available liquidity will be depleted rapidly [3].

This case also shows that the stability of the bank is not only related to the level of book capital, but also related to the liquidation liquidity, asset liquidation ability, and information communication to the expectations of the market. Therefore, in the management practice, the bank should also actively release the information to the market [9]. For example, matters such as the unrealized loss or financing arrangement can be gradually disclosed, and the liquidity support arrangement and risk arrangements

should also be explained so as to reduce the wrong interpretation of the market and the panic psychology. In addition, a regular communication mechanism should also be established for the large depositors to report liquidity status, stress test results and emergency financing arrangement regularly. Only by maintaining transparency and stabilizing the expectations of the market can people weaken the amplification effect of liquidity pressure and the decline in confidence, so as to reduce the possibility of sudden withdrawal.

4.4 Reflection on Regulatory Framework and Institutional Design

From the perspective of regulations and institutions, the Silicon Valley Bank incident unveiled the institutional blind spots in the risk supervision of medium-sized banks. Currently, the intensity of regulatory supervision is generally stratified according to the size of the bank. However, from the perspective of systemic risk, the impact of the risk is not entirely determined by the size of the bank but is closely related to the customer structure of the bank, the duration of the assets, and the key position of the bank in a certain industry [2]. Owing to the above risks, the regulatory authorities had foreseen the related risks beforehand. However, when the intensity and time efficiency of corrective actions were not high enough, the risks were still in the adjustable stage, and the regulatory authorities failed to effectively prompt the bank to reduce the duration risk or to increase the liquidity buffer [10]. Therefore, from the perspective of the future, regulatory institutions should focus more on the orientation of risk characteristics.

5 Conclusion

This article selects the rise and falls of Silicon Valley Bank as the research object, adopts the case analysis method to systematically study the whole process from its birth, rapid growth, maturity to its collapse. Based on this, this article systematically analyzes the causes of the collapse of SVB from four aspects: macro environment, banking business model, risk transmission process and regulatory arrangement. Comprehensive analysis shows that the bankruptcy of SVB is not a single decision-making error or a deviation in the short term but is the joint action of multiple inherent weaknesses and external shocks in a certain interest rate cycle and industry environment. That is to say, facing the long-term loose monetary policy and the rapid development of the technology industry, the cash flow characteristics of technology enterprises, which are highly dependent on external financing, caused a large amount of funds to flow into Silicon Valley Bank within a short period. This situation not only caused the rapid development of the scale of the bank but also caused the highly concentrated customer structure and liability source. On this basis, Silicon Valley Bank increased the yield of assets by allocating long-term fixed rate bonds, but noticeably extended the duration of assets, making the bank itself very sensitive to interest rate changes. When the Federal Reserve began to enter the rapid interest rate hike cycle, the unrealized loss of the bank's asset side rapidly expanded, and the simultaneous tightening of the financing environment in the technology industry triggered continuous withdrawal pressure on liability. When the key information disclosure caused the shock of market confidence,

large clients with a large proportion of unfunded deposits took rational hedging behavior, which triggered the self-reinforcing run process and accelerated the depletion of bank liquidity.

Furthermore, studies also found that regulatory factors were equally crucial in the SVB accident. That is, regulatory authorities had identified the risks of the bank in terms of interest rate exposure and deposit concentration before the accident, but because regulatory authorities did not implement corresponding rectification and restriction measures in the stage where risks were not yet evident, problems accumulated gradually in the asset duration and customer structure and were soon triggered by external shocks.

In summary, the SVB case offers significant warnings for banks and regulatory authorities, respectively. For banks, in addition to promoting their specialized strategies and scale expansion plans, they should prudently handle the asset duration structure and customer concentration issues, as well as reserve sufficient liquidity buffers; while for regulatory authorities, in addition to focusing on the scale, more attention should be paid to the risk structure characteristics of banks and their industry correlations, and not to rely on the scale as the main criterion for prudent regulations. The failure of SVB shows that when the industry concentration is high, the factors of large uninsured deposits, mismatch of asset durations, and the upward momentum of interest rates may interact with each other, and enhance the vulnerability of the banking system, so this case can provide references for improving liquidity supervision, concentrating risk monitoring, and information disclosure arrangements.

Future research is very possible to point out that several important empirical directions can greatly deepen comprehension of these key methodological factors. Moreover, this study may indicate that expanding sample scope to compare specialized banks among different countries or regions can display important differences in risk transmission and regulatory reactions. Thus, quantitative models may reveal factors such as industry concentration, asset duration, and uninsured deposit proportions have influence on bank stability. In consideration of findings on digital finance and fast information spread, the triggering and diffusion mechanisms of bank runs may show that further study is necessary. However, research may demonstrate relationships between online withdrawal speed and market sentiment spread need attention, together with the improvement of early warning and crisis handling tools. Given that these important empirical findings can probably prove that vulnerability sources in modern banking systems need careful analysis, the evidence may reasonably show that such studies will support the construction of more resilient financial stability frameworks. Furthermore, the results may suggest that these key theoretical implications can provide information for regulatory responses across various institutional contexts. Therefore, findings may indicate early warning tools have effect on crisis results. Nevertheless, research can show digital spread mechanisms impact systemic risk. Thus, studies may help support the construction of resilient financial stability frameworks.

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